



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,711	06/12/2006	Pierre Blanchard	4590-523	7171
33308 7590 02/02/2010 LOWE HAUPTMAN HAM & BERNER, LLP 1700 DIAGONAL ROAD, SUITE 300 ALEXANDRIA, VA 22314				
EXAMINER JONES, ERIC W				
ART UNIT 2892		PAPER NUMBER		
MAIL DATE 02/02/2010		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/582,711

Applicant(s)

BLANCHARD, PIERRE

Examiner

ERIC W. JONES

Art Unit

2892

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-23, 25 and 30-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-23, 25 and 30-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 16-21, 23, 25 and 30; 31-36, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourquier (WO 03/019669 hereafter Pourquier 669 (original and translation provided) as evidenced by Pourquier (US 6,960,483 B2 hereafter Pourquier 483-prior art of record) in view of Blanchard et al (US 6,621,107 B2-prior art of record).

Re claim 16, Pourquier 669 (as evidenced by Pourquier 483) discloses a process for the fabrication of electronic chips from a semiconductor wafer comprising, on its front face, a thin active layer of semiconductor material, the process comprising steps of:

formatting of etched layers (16 in FIG. 1) on the active layer (12 in FIG. 1); bonding the wafer (10 in FIG. 1) by its front face (FIG. 4) onto a support substrate (20 in FIG. 3); and thereafter thinning down of the semiconductor wafer via a backside (30 in FIG. 4) opposite the front face, depositing at least one metal layer (56 in FIG. 5) on the backside thus thinned,

said process including the following steps: etching trenches (25 in FIG. 2) into the thin active layer, before the bonding operation, these trenches extending into the wafer

over a depth approximately equal to the residual semiconductor wafer thickness that will remain after the thinning operation (FIG. 4),

filling the space opened by said trenches with a conducting material (14 in FIG. 2) isolated (insulator 26 in FIG. 2) from the active layer (12), thus forming conducting vias between the front face and the backside of the thinned wafer (FIG. 4),

wherein said trenches comprise a series of trenches (FIG. 4) located under the contact pad (54 and 56 in FIG. 5), the contact pad being in electrical contact with the conducting material in said parallel trenches. (Pourquier 483, column 3, lines 12-67; column 4, lines 1-37; column 5, lines 1-9)

Pourquier 669 fails to disclose etching at least one contact pad in said metal layer; and narrow, parallel, vertical trenches.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55); and etching at least one contact pad in a metal layer (218 in FIGS 5 and 6F; column 8, lines 22-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches and etching at least one contact pad in a metal layer of Blanchard et al for the trenches and metal layer of Pourquier 669 to form trench-based semiconductor devices. (Blanchard et al, Title)

Re claim 17, Pourquier 669 (as evidenced by Pourquier 483) discloses the trenches are formed before other deposition and etching steps of electrically functional layers on the front face of the semiconductor wafer. (Pourquier 483, column 3, lines 32-62)

Re claim 18, Pourquier 669 fails to disclose the trench takes the form of an alignment marker visible from the backside after thinning in order to allow alignment of the patterns for etching of the layers on the backside with respect to the patterns for etching of layers on the front face.

The recitation 'the trench takes the form of an alignment marker visible from the backside after thinning in order to allow alignment of the patterns for etching of the layers on the backside with respect to the patterns for etching of layers on the front face' is only a statement of the inherent properties of the 'process for the fabrication of electronic chips from a semiconductor wafer'. Once formed, the trenches can serve as alignment marks for subsequent backside device processing. The structure recited in Pourquier 669 is substantially identical to that of the claims, claimed properties or functions, therefore, are presumed to be similar. Or where the claimed and prior art products are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). See MPEP § 2112.02.

Re claim 19, Pourquier 669 (as evidenced by Pourquier 483) discloses the metal layer (conductive boss 56 in FIG. 5) is deposited onto the backside of the wafer (30 in FIG. 5) after thinning, this layer being connected, by conducting vias (22 in FIG. 5) formed within at least one trench, to at least one conducting layer (22 in FIG. 5) formed. (Pourquier 483, column 3, lines 12-67; column 4, lines 1-37; column 5, lines 10-18)

Pourquier 669 (as evidenced by Pourquier 483) fails to disclose narrow trench; and prior to bonding the wafer onto the support substrate, on the front face of the wafer.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches of Blanchard et al as discussed above for claim 16.

With respect to prior to bonding the wafer onto the support substrate, it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit said metal layer prior to bonding the wafer onto the support substrate since the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930). See MPEP § 2144.04.

Re claim 20, Pourquier 669 (as evidenced by Pourquier 483) discloses said electronic chips comprise at least one image sensor with a matrix of pixels and the said at least one metal layer comprises a pattern within the matrix of pixels. (Pourquier 483, FIGS. 1 and 5; column 3, lines 9-26 and column 5, lines 10-18)

Re claim 21, Pourquier 669 (as evidenced by Pourquier 483) discloses layers of color filters are deposited onto the backside of the wafer after bonding and thinning. (Pourquier 483, column 5, lines 1-9)

Re claim 23, Pourquier (as evidenced by Pourquier 483) discloses the trenches (25 in FIG. 2) have their internal walls coated with an insulator (26 in FIG. 2) and are filled with a metal (14 in FIG. 2). (Pourquier 483, column 3, lines 54-62)

Pourquier 669 fails to disclose a thin silicon oxide and highly doped polycrystalline silicon.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55) filled with silicon oxide (210 in FIGS. 5 and 6C; column 5, lines 60-67) and doped polysilicon (211 in FIGS. 5 and 6C; column 5, lines 60-67 and column 7, lines 51-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches with the silicon oxide and doped polysilicon fillings of Blanchard et al as discussed above for claims 16 and 19.

Re claim 25, Pourquier 669 fails to disclose the semiconductor wafer comprises a highly-doped silicon substrate coated with a more lightly doped epitaxial layer forming the active layer, of around 5 to 20 microns thickness, and in that the depth of the trenches is substantially equal to the thickness of the epitaxial layer.

Blanchard et al disclose in FIGS. 5 and 6A-c a semiconductor wafer comprises a highly-doped silicon substrate (1×10^{19} to 5×10^{20} N⁺-silicon 200 in FIG. 6A) coated with a more lightly doped epitaxial layer (1×10^{15} to 5×10^{20} P-silicon 204 in FIG. 6A) forming the active layer, of around 0.3 to 5 microns thickness, and in that the depth of the trenches (219a-c in FIG. 5) is substantially equal (0.3 to 4 microns) to the thickness of the epitaxial layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the substrate doping level and the epitaxial layer doping

level and thickness of Blanchard et al with the method of Pourquier 669 to form trench-based semiconductor devices. (Blanchard et al, Title)

Re claim 30, Pourquier 669 (as evidenced by Pourquier 483) discloses wherein said trenches (FIG. 5) comprise a continuous trench completely surrounding a semiconductor region (the trenches in FIG. 5 surround a region of semiconductive wafer 10) below said contact pad (56 in FIG. 5), the contact pad being electrically connected through said semiconductor region to at least one conductive layer (metal 22 in FIG. 5) formed during said step of formatting. (Pourquier 483, column 3, lines 12-67; column 4, lines 1-37; column 5, lines 1-9)

Pourquier 669 fails to disclose a continuous trench completely surrounding said parallel trenches; and the contact pad being isolated from the conductive material filling said continuous trench.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55); a continuous trench completely surrounding said parallel trenches (if FIGS. 5 and 6F were shown extended both right and left, a repeating series of trenches similar to 219a-c would obviously be seen; in which case those trenches would both completely surround said parallel trenches 219a-c and surround the semiconductor regions between the trenches); and the contact pad (218) being isolated (oxide 216 in FIG. 5; column 6, lines 43-49) from the conductive material filling (polysilicon 211 in FIG. 5; column 6, lines 43-49) said continuous trench.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the trench formation of Blanchard et al for the trenches of Pourquier 669, and to use them and the oxide isolation to form trench-based semiconductor devices. (Blanchard et al, Title)

Re claim 31, Pourquier 669 (as evidenced by Pourquier 483) discloses a process for the fabrication of contact pads of electronic chips in a semiconductor wafer comprising, on a front face of the wafer, a thin active layer of semiconductor material, the process comprising steps of:

formatting of etched layers (16 in FIG. 1) on the active layer (12 in FIG. 1); bonding the wafer (10 in FIG. 1) by its front face (FIG. 4) onto a support substrate (20 in FIG. 3); and thereafter thinning down of the semiconductor wafer via a backside (30 in FIG. 4) opposite the front face, depositing at least one metal layer (56 in FIG. 5) on the backside thus thinned,

said process including the following steps: etching trenches (25 in FIG. 2) into the thin active layer, before the bonding operation, these trenches extending into the wafer over a depth approximately equal to the residual semiconductor wafer thickness that will remain after the thinning operation (FIG. 4),

filling the space opened by said trenches with a conducting material (14 in FIG. 2) isolated (insulator 26 in FIG. 2) from the active layer (12), thus forming conducting vias between the front face and the backside of the thinned wafer (FIG. 4),

wherein said trenches (FIG. 5) comprise a continuous trench completely surrounding a semiconductor region (the trenches in FIG. 5 surround a region of

semiconductive wafer 10) below said contact pad (56 in FIG. 5), the contact pad being electrically connected through said semiconductor region to at least one conductive layer (metal 22 in FIG. 5) formed during said step of formatting. (Pourquier 483, column 3, lines 12-67; column 4, lines 1-37; column 5, lines 1-9)

Pourquier 669 fails to disclose etching at least one contact pad in said metal layer; narrow, parallel, vertical trenches; and the contact pad being isolated from the conductive material filling said continuous trench.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55); etching at least one contact pad in a metal layer (218 in FIGS 5 and 6F; column 8, lines 22-35); and the contact pad (218) being isolated (oxide 216 in FIG. 5; column 6, lines 43-49) from the conductive material filling (polysilicon 211 in FIG. 5; column 6, lines 43-49) said continuous trench.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches and etching at least one contact pad in a metal layer of Blanchard et al for the trenches and metal layer of Pourquier 669, and to use them and the oxide isolation to form trench-based semiconductor devices. (Blanchard et al, Title)

Re claim 32, Pourquier 669 (as evidenced by Pourquier 483) discloses the trenches are formed before other deposition and etching steps of electrically functional layers on the front face of the semiconductor wafer. (Pourquier 483, column 3, lines 32-62)

Re claim 33, Pourquier 669 fails to disclose the trench takes the form of an alignment marker visible from the backside after thinning in order to allow alignment of the patterns for etching of the layers on the backside with respect to the patterns for etching of layers on the front face.

The recitation 'the trench takes the form of an alignment marker visible from the backside after thinning in order to allow alignment of the patterns for etching of the layers on the backside with respect to the patterns for etching of layers on the front face' is only a statement of the inherent properties of the 'process for the fabrication of electronic chips from a semiconductor wafer'. Once formed, the trenches can serve as alignment marks for subsequent backside device processing. The structure recited in Pourquier 669 is substantially identical to that of the claims, claimed properties or functions, therefore, are presumed to be similar. Or where the claimed and prior art products are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). See MPEP § 2112.02.

Re claim 34, Pourquier 669 (as evidenced by Pourquier 483) discloses the metal layer (conductive boss 56 in FIG. 5) is deposited onto the backside of the wafer (30 in FIG. 5) after thinning, this layer being connected, by conducting vias (22 in FIG. 5) formed within at least one trench, to at least one conducting layer (22 in FIG. 5) formed. (Pourquier 483, column 3, lines 12-67; column 4, lines 1-37; column 5, lines 10-18)

Pourquier 669 (as evidenced by Pourquier 483) fails to disclose narrow trench; and prior to bonding the wafer onto the support substrate, on the front face of the wafer.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches of Blanchard et al as discussed above for claim 31.

With respect to prior to bonding the wafer onto the support substrate, it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit said metal layer prior to bonding the wafer onto the support substrate since the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930). See MPEP § 2144.04.

Re claim 35, Pourquier 669 (as evidenced by Pourquier 483) discloses said electronic chips comprise at least one image sensor with a matrix of pixels and the said at least one metal layer comprises a pattern within the matrix of pixels. (Pourquier 483, FIGS. 1 and 5; column 3, lines 9-26 and column 5, lines 10-18)

Re claim 36, Pourquier 669 (as evidenced by Pourquier 483) discloses layers of color filters are deposited onto the backside of the wafer after bonding and thinning. (Pourquier 483, column 5, lines 1-9)

Re claim 38, Pourquier (as evidenced by Pourquier 483) discloses the trenches (25 in FIG. 2) have their internal walls coated with an insulator (26 in FIG. 2) and are filled with a metal (14 in FIG. 2). (Pourquier 483, column 3, lines 54-62)

Pourquier 669 fails to disclose a thin silicon oxide and highly doped polycrystalline silicon.

Blanchard et al disclose in FIGS. 5 and 6A-F narrow, parallel, vertical trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55) filled with silicon oxide (210 in FIGS. 5 and 6C; column 5, lines 60-67) and doped polysilicon (211 in FIGS. 5 and 6C; column 5, lines 60-67 and column 7, lines 51-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the narrow, parallel, vertical trenches with the silicon oxide and doped polysilicon fillings of Blanchard et al as discussed above for claims 16 and 19.

Re claim 39, Pourquier 669 fails to disclose the semiconductor wafer comprises a highly-doped silicon substrate coated with a more lightly doped epitaxial layer forming the active layer, of around 5 to 20 microns thickness, and in that the depth of the trenches is substantially equal to the thickness of the epitaxial layer.

Blanchard et al disclose in FIGS. 5 and 6A-c a semiconductor wafer comprises a highly-doped silicon substrate (1×10^{19} to 5×10^{20} N⁺-silicon 200 in FIG. 6A) coated with a more lightly doped epitaxial layer (1×10^{15} to 5×10^{20} P-silicon 204 in FIG. 6A) forming the active layer, of around 0.3 to 5 microns thickness, and in that the depth of the trenches (219a-c in FIG. 5) is substantially equal (0.3 to 4 microns) to the thickness of the epitaxial layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the substrate doping level and the epitaxial layer doping

level and thickness of Blanchard et al with the method of Pourquier 669 to form trench-based semiconductor devices. (Blanchard et al, Title)

3. Claims 22 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourquier 669 (as evidenced by Pourquier 483) and Blanchard et al as applied to claims 16 and 31 above, and further in view of Pourquier et al (WO 03/019668 hereafter Pourquier 668 (original and translation provided) as evidenced by Pourquier (US 7,217,590 B2 hereafter Pourquier 590-prior art of record).

Re claims 22 and 37, Pourquier 669 and Blanchard et al fail to disclose the semiconductor wafer and its support substrate are bonded onto another, transparent, substrate and the support substrate is eliminated.

Pourquier 668 (as evidenced by Pourquier 590) disclose the semiconductor wafer (30 in FIG. 4) and its support substrate (20 in FIG. 4) are bonded onto another, transparent, substrate (80 in FIG. 7) and the support substrate is eliminated. (column 8, lines 33-62; column 9, lines 3-18)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the semiconductor wafer and its support substrate are bonded onto another, transparent, substrate and the support substrate is eliminated of Pourquier 668 (as evidenced by Pourquier 590) with the method of Pourquier 669 (as evidenced by Pourquier 483) and Blanchard et al to produce connection pads flush with the conductive layers of the imager. (Pourquier 590, column 9, lines 15-18)

Response to Arguments

4. Applicant's arguments filed 11/18/2009 have been fully considered but they are not persuasive.

A. In Re applicant's arguments that ***the combination of Pourquier (WO 03/019669) as evidenced by Pourquier (US 6,960,483 B2) and Blanchard et al (US 6,621,107 B2) is improper to satisfy the claimed limitation(s) of etching at least one contact pad in said metal layer; and narrow, parallel, vertical trenches.***

The examiner, respectfully, disagrees and takes the position that the combination of Pourquier and Blanchard et al is proper since the contribution of Blanchard et al is with respect to the geometrical aspect (i.e. ***narrow, parallel, vertical***) of the trenches (219a-c 0.4 to 2.0 microns in FIG. 5 and FIG. 6C; column 5, lines 48-55); and the etching at least one contact pad in a metal layer (218 in FIGS 5 and 6F; column 8, lines 22-35); and ***not*** to the type of structure being produced comprising the trenches and contact pad(s).

Further in response to applicant's arguments against the references individually, even though the trenches and contact pad(s) of Blanchard et al are being used for a different type of structure, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

The examiner submits that the use of the trench geometries and the contact pad formation of Blanchard et al does not change the principle of operation of the primary

reference or render the reference inoperable for its intended purpose. See MPEP § 2143.01. The test for obviousness is not whether the features of the secondary reference may be bodily incorporated into the structure of the primary reference. Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)

B. In Re applicant's arguments that *Pourquier (WO 03/019669) as evidenced by Pourquier (US 6,960,483 B2) fails to disclose filling the space opened by said trenches with a conducting material since the conductive material is only along the sidewalls and bottom of the trenches.*

The examiner, respectfully, disagrees and takes the position that the conductive filling (14 in FIG. 2) of Pourquier in the trenches (25 in FIG. 2) satisfies the claimed limitation(s) since no specificity with respect to degree of the trench being filled with the conductive material is being claimed.

As such, any amount of conductive filling and/or in any location within the trench would satisfy the limitation(s) as currently claimed.

Although the claims are interpreted in light of the specification, limitations from the specification (e.g. that the trench spaces are completely filled with conductive material) are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

C. In Re applicant's arguments that *Pourquier (WO 03/019669)* as **evidenced by *Pourquier (US 6,960,483 B2)* fails to disclose said trenches comprise a continuous trench completely surrounding a semiconductor region below said contact pad, the contact pad being electrically connected through said semiconductor region.**

The examiner, respectfully, disagrees and takes the position that the said trenches FIG. 5 of *Pourquier* comprise a continuous trench completely surrounding a semiconductor region below said contact pad 56 in FIG. 5, the contact pad being electrically connected through said semiconductor region since the trenches in FIG. 5 extend from top to bottom of layers 14/16/30 in FIG. 5 and surround a region of semiconductive wafer 10 which has been thinned to become semiconductive wafer 30 between them with contact pad(s) 56 connecting to the active regions not shown in the wafer 30.

Such an interpretation of *Pourquier* is consistent with applicant's FIG. 11 which shows series of trenches (22' and 26') with semiconductor regions interposed between them.

In view of the above responses to the applicant's arguments, it is deemed that ALL claimed limitations of claims 16 and 31 are satisfied properly by the combination *Pourquier* and *Blanchard et al.*

Therefore, the Non-Final Rejections dated 8/19/2009 are maintained for a Final Rejection of ALL pending claims (16-23, 25 and 30-39).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC W. JONES whose telephone number is (571)270-3416. The examiner can normally be reached on Monday-Friday 5:30AM-3:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao X. Le can be reached on (571)272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thao X Le/
Supervisory Patent Examiner, Art
Unit 2892

/ERIC W JONES/
Examiner, Art Unit 2892
1/26/2010